NITE-TIMES NEWS

CHICAGO AREA TIMEX USERS GROUP

Chicago Area Timex Users Group — Downers Grove, Illinois
Volume 4, Number 4 — July/August 1990

MEMORY MAP

ROUTINES — ***ADDRESS***

C.A.T.U.G. CLUB OFFICERS

Here is the list of 1990 club officers and how to contact them. The club has two strong SIGS, SPECTRUM/TS2068 and QL. If you have questions about either of these fine machines or even the ZX81/TS1000/TS1500 call one of the officers. C=312, S=708.

POSITION	NAME	PHONE	PRIMARY FUNCTION
President	Butch Weinberg	C373-2470	The buck stops here...
Vice-President	Bob Swoger	S576-8068	Newsletter, BBS, etc.
Secretary	John Donaldson	S232-6147	Records and Reporting
Treasurer	Al Feng	S971-0495	Dues and Purchasing

NITE-TIMES Information

The Nite-Times News is the newsletter of the Chicago Area Timex Users Group. For an annual fee of $10.00 you can become a CATUG member with full membership privileges. Send your dues to :

CATUG Treasure Al Feng
15 Wake Robin Ct.
Woodridge, IL 60517

The Chicago Area Timex Users Group is pleased to exchange newsletters with other Timex and Sinclair supporting users groups at no charge. Send all newsletter requests to:

CATUG - C/O Bob Swoger
613 Parkside Circle
Streamwood, IL 60107

If you desire to reprint any articles that appear here, please provide credit to the author and this newsletter.

We encourage your user group to copy this newsletter and distribute it at your regular meetings to your members free of any charge as we believe that this will encourage better meeting attendance. If you are a user group that feels as we do, please let us know in your newsletter so that we might do this for our members and keep our attendance up.

Articles originating from our group can be had on SSDD LarKen Disk for use in Magazines by contacting the editor. As this newsletter can be downloaded from our BBS you may reprint it using this means.

NITE-TIMES CONTRIBUTIONS

If you would like to contribute an ARTICLE to the newsletter upload a file into the Club machine called NITETIMES.ART If you have an AD for the newsletter upload a file called COMPUTER.ADS If you have NEWS to POST about your group, upload a file called POST.NWS

These files are gathered by the BBS computer and downloaded to the editor. If you don't have a CATUG account either get one or contact the editor by mail, in person, or by phone:

NITE-TIMES NEWS EDITOR
Bob Swoger
613 Parkside Circle
Streamwood, IL 60107

It is preferred that you call: H708/837-7957 or W708/576-8068

CONTRIBUTORS TO THIS ISSUE

Derik Ashton
Al Feng
John Donaldson
Bob Swoger, K9WVY

CLUB MEETINGS

The Chicago Area Timex Users Group meets on the second Saturday of each month at the home of out meeting coordinator Steve Cooper in Downers Grove, Illinois from 1:00 to 5:00 PM. Steve's home is lovingly called the CLUB HOUSE and is located at 1300 Maple Street in Downers Grove just 2 blocks southwest of the Downers Grove Public Library. Steve can be contacted evenings at 708/968-3553.

When visiting be careful of the Dutch Doooooooooorrrrrrrr.....

DATA INTERRUPT

After over six years of continuous operation the Club computer, a PDP 11/60, has gone down. This has caused the newsletters to get way behind. This is also the computer that ran the SNUG BBS.

It is our hope to either get this computer up and running again or migrate to another machine. This work will not begin until the fall season as our computer hardware people hibernate during the summer. We have two other machines to possibly go to, a PDP 11/23+ and a PDP 11/34. Wish us luck on getting something going! In the mean time look for us as guests on the machine listed below in GATORs twisted pair.

FROM THE EDITOR'S DESK

Now that the SINCLAIR 1990 Family Reunion and my daughter's high school graduation are over it seems like a big come down, as though there is nothing left for the summer. The Glenside club feels the same way with nothing planned for the summer when most computerists go into hibernation anyway. So, to put some anticipation back into the summer months, we will hold a picnic on September 8th, for both clubs, to give us some excitement to look forward to. So mark it on your calenders, SEPTEMBER 8th, at my place. Bring a cold pass around dish and some industrial strength bug spray. Glenside will supply the buns, meat for the barbee and the games. Just contact me or the Prez of Glenside and let us know how many your bringing.

Glenside will show us how they can play music from two keyboards simultaneously using OS-9 and MULTIMUS, the software written for Second City Software by Mike Knudsen, a friend of our own John Donaldson. Stop by and make this a good computer family get-together.

Bob Swoger, Editor
Chicago Area Timex Users Group

TREA$URY NOTE$

Our balance stands at $291.33. Our current paid membership stands at 25.

Al Feng, Treasurer
Chicago Area Timex Users Group

SECRETARY'S NOTEPAD

July 14, 1990

Meeting was called to order at 2:28 PM. Those present: Messrs. Brezina, Cooper, Feng, Mills, Pashtoon, Sauter, Swoger and Weinberg.

The SMUGFest was a success according to most of our members. Meeting people we'd only known by name but had never met before was a definite plus. Bob Swoger was very happy with it because just about everyone with a LarKen disc system for the TS2068 who saw LogiCall, his program, bought it. He knew of at least one hold-out. Documentation and up-dated software is being sent to those buyers.

There was a good selection of Spectrum software at the fest. A digitizer was shown in action and special notice was taken of it. There were many door prize drawings (mostly TS2068 tapes), with CATUG members winning quite a few, indeed.

About 300 attended the 2-day event, coming from as far as Canada, Florida and the West Coast. While EmSoft and Wood & Wind were the only vendors in evidence, Zebra shipped items for sale and in the first morning, every TS2040 and Alphacom printer was sold to one buyer! The majority of sales were made by individuals.

It was felt by all that it was a "FUN" fest affirming what appeared on SMUGFest's bumper sticker: "STILL ALIVE WITH UNCLE CLIVE".

Bob Swoger received a new ROM for the JLO from LarKen to help try to sell LarKen DOS boards to our three JLO users. [It seems that because the JLO users paid so much for their systems, they have no money left to add LarKen to their systems! but I'll keep trying, Larry]

The QL SIG bought a half dozen QL boards in "as-is" condition from Mark Stueber (Sharp's) and Nazir Pashtoon was pleased to say that he has revived all but 1. Gary Lessenberry acquired 2 monitors in a search authorized at an earlier CATUG meeting. One was monochrome and was bought by Al Feng; the other is an Amdek composite/ RGB monitor and is waiting approval by the

club. Bob Swoger purchased the Magnavox RGB 80 from Al last month and used it at the fest. Bob Swoger, incidentally, has access to the service manual for it. We understand that these are hard to find.

A hearty welcome to two new members, Don Gillespie and Ed De Boer.

The SNUG BBS is up and running but SNUG hasn't uploaded a thing. Are they looking for engraved invitations??

SINCUS, apparently, will not discontinue support for Sinclair despite swinging its primary interest to MS-DOS.

An impromptu discussion was held to exalt our old friend BASIC. History will note that BASIC was originally written for large computers and has been rewritten in various forms as the machines became smaller with smaller memories. One of its advantages/disadvantages was that since there were no standards, the language could be rewritten for each application when need arose. Bob Swoger feels that Cambridge Basic for the Z80 is still superior to and more elegant than the forms he has seen on Atari, Commodore, Tandy and other Microsoft flavors, he has fought with them all. His Logi-Call program DISKS.B1/TAPES.B1 in NTN V3#5 handles data in a way even IBM can't do.

Steve Cooper has come up with a novel way to popularize Sinclair computers. He took the box end from his Timex Sinclair TS1000 and placed it in the rear window of his car. This may attract someone who's looking for a user group or someone who's willing to part with his old Timex or Sinclair products. It's worth a try!

After the meeting was closed, Al Feng demonstrated his QLuMSiDOS which will appear in an upcoming UPDATE magazine. It produces an MS-DOS environment to provide a tutorial in file matching syntaxes. Following that demo, Bob Swoger showed the LarKen demo disk for TS2068 fans that he modified for JLO and LogiCall. You can go from one program to another on the disk and never turn off the machine to RESET it!

August 11, 1990

Meeting was opened at 2:15 PM. Those present: Messrs. Brezina, Cooper, Donaldson, Feng, Mills, Swoger, Pashtoon and Majewski.

The latest report on LogiCall sales was that 16 copies were sold at SMUGfest - to rave reviews from some users. The current version of DISKS.B1/ TAPES.B1 includes a feature which eliminates stepping through the the screens in sequence to see the contents of each box. Now just hitting a number permits accessing that box directly. DISKS.B1 now holds information on forty library cases on just three tracks of a LarKen disk.

The treasurer was instructed to pay $70 for the AMDEK color monitor which was obtained last month.

The Glenside Computer Club has extended an invitation to CATUG to attend a picnic at Bob Swoger's home on September 8th at 1PM.

The meeting was closed at 3:15 PM.

Tragedy has struck -- not once but twice! It is evident that the above notes are extremely brief. Your humble secretary relies on a microcassette recorder to catch every word. Unfortunately, something went awry and it didn't catch any. And the secretary's memory isn't as sharp as it used to be. Sorry! But the second strike is the one that really hurts. After 6 years of 24-hours-a-day operation, the club's PDP computer went belly up! At this time, the tape drives seem O.K. but there is an as-yet insurmountable problem in the electronics.

Result: Production of Nite-Times News plus 3 other user group newsletters has been suspended for the duration. Swoger says it looks grim. He's looking for alternatives.

John Donaldson, Secretary
Chicago Area Timex Users Group

GATOR's TWISTED PAIR

!!!!!! TAKE NOTE !!!!!!
We are on a new computer.

As you have just read in John Donaldson's report, the PDP is down. Fortunately we have friends! We have migrated to a VAX but I will have to learn DCL to get the BBS fully operational again. You may upload and read all the information in the DIRectory. You see the DIRectory by typing DIR, you upload by typing UPLOAD filename.type and you read by typing TYPE filename.type . If you wish to download to a TS2068 with MTERM II type DOWNLOAD filename.type. Use the info below to log-in. Sorry for the inconvenience.

! ! ! R E M E M B E R ! ! !
We STILL have a 24 hour BBS and encourage you to exchange mail and contribute to the Download Section. Use it and have fun!

```
*******************************
*     C A T U G  B B S        *
*       708/576-7140          *
*   Type at the > prompt:     *
*    MOTOROLA then GUEST      *
*      BYE to log out         *
*******************************
```

Bob Swoger, SYSOP
Chicago Area Timex Users Group

NEWS ITEMS

MEETING NOTICE:
Because of schedule conflicts the October meeting will be **moved to October 20th.**

ITEMS FOR SALE THROUGH THE CLUB

LogiCall AOS-LKDOS Software Ensemble for TS2068 and Spectrum includes LogiCall 4.2 TASWORD II V2.2 VU-CALC VU-FILE MTERM2.B1 Drivers modified for LogiCall, DISKS.B1 TAPES.B1 steprt.B1 HEADER.BT (tape header reader by Nazir Pashtoon) FORMAT.Bx MOVE.BL and more all on 2 SSDD disks for $5. You must specify your LK-DOS EPROM version. If you already have a copy you are encouraged to distribute copies to other LarKen LK-DOS users for as you see by the price we are not in the business of making money on it, just making LK-DOS the BEST!

Like to fly? The 747 Flight Simulator for Spectrum by Derek Ashton of DACC sold over 40K copies in EUROPE. Requires Spectrum Emulator. Supplied on LarKen SSDD or DSQD disk only at this time for $10 which goes to Derek Ashton now working at MOTOROLA, INC., Schaumburg, IL.

Call in requests to Bob Swoger at W708-576-8068 H708-837-7957

SPECIAL DEALS AND BUYS

It has come to our attention that some LarKen Users are using something less than Version 3 firmware. The club will supply updated EPROMS, SYSTEM DISKS, and MANUALS for just $5 which includes shipping and handling.

If you are a LarKen LK-DOS owner and would like a SPECTRUM V2 kit for your system we will supply an EPROM, socket and 74HCT32 for $12 which includes shipping and handling. The install instructions are in your LarKen manual. We shall not be responsible for your install job. AERCO owners need only the SPECTRUM EPROM.

Call in requests to Bob Swoger at W708-576-8068 H708-837-7957

ARTICLES

CONVERT BASIC INTO TEXT

by
Bob Swoger

This program converts a TS2068 BASIC program in memory to an MSCRIPT text file.

When you have to generate a newsletter and need to get your BASIC program into a word processor to work on it's appearance or upload it to another kind of computer for publication 'BASIC to TEXT' does the job.

If you work only with TASWORD TWO, you will next convert the MSCRIPT file to a TASWORD TWO file using Kurt CASBY's program UNLOADER (CNVRT.BV) which was part of his ensemble LOADER V. That program unloads (converts) the MTERM II buffer or an MSCRIPT file into a TASWORD TWO file.

With the use of these two programs our editor is able to move all the 'ones and zeros' he obtains from all types of computers on the other end of his phone line, work them into a 31 wide, right justified with real spaces, column for the BBS and newsletter, pick them up at work in his MACINTOSH SE and print out the newsletter on an APPLE LASER WRITER! [MAC is his employers choice, not his own, for two reasons. Not only because when it comes to computers are they functionally illiterate, but also because they are the makers of the 68000 series microprocessors!]

BASIC TO TEXT is a machine code program. What I have attempted to do here is give you a driver and BASIC machine code generator so that you could have this program yourselves. I do not know the source of this fine program, but if any of you know, let us know and we will give that person credit. Though other small computers have the ability to put their BASIC code into a text file and back again to BASIC, TS2068 has long been needing this feature and this program is only half of it.

These programs are downloadable to MTERM II from our BBS as BS2TXT.B1 and BS2TXT.B2 or write us and ask for a LarKen SSDD disk.

PROGRAM #1

```
 10 REM ************************
 11 REM * TS-2068  Basic>Text *
 12 REM * INSTRUCTION PROGRAM *
 13 REM ************************
 15 BORDER 1: INK 9: PAPER 1
 20 CLEAR 64899: POKE 23658,0
 30 RANDOMIZE USR VAL "100": LO
AD "bs2txt.C1"CODE 64900,592
 40 PRINT "This program convert
s a BASIC","program listing int
o an ASCII","text file that can
be saved and","loaded into a wo
rd processor. "
 50 PRINT '"** BASIC TO TEXT P
ROCEDURES **"
 60 PRINT '"1. CLEAR 64899"
 70 PRINT "2. Load your BASIC p
rogram."
 80 PRINT "3. Load bs2txt.C1 co
de"
 90 PRINT "4. Enter: RANDOMIZE
USR 64909"
100 PRINT "5. Enter: RANDOMIZE
USR 65042: PAUSE 0"
110 PRINT "6. SAVE per the ins
truction."
120 PRINT "7. Use CONVRT.BV to
convert file to Tasword Two."
130 STOP : GO TO 9998
9992 RANDOMIZE USR VAL "100": S
AVE "BS2TXT.B1" LINE 1
9993 REM RANDOMIZE USR VAL "100
": SAVE "bs2txt.C1"CODE 64900,5
92
9998 RANDOMIZE USR VAL "100": L
OAD "L.B1"
```

PROGRAM #2

```
 10 REM ************************
 20 REM *    BASIC-TO-TEXT     *
 30 REM * MACHINE CODE LOADER *
 40 REM * BY BOB SWOGER  V1.0 *
 50 REM ************************
110 CLEAR 64899: RESTORE 4900
120 FOR I=1 TO 592
130 READ A
140 POKE (I+64899),A
150 NEXT I
160 GO TO 9993
200 LIST : STOP
```

```
4900 DATA
000,000,000,000,000,000,000,000,
000,237,075,083,092,042,075,092,
237,066,035,035,229,193,237,067,
137,253,237,091,178,092,237,083,
135,253,042,075,092,237,184,019,
237,083,133,253,017,216,253,001,
058,000,205,219,033,205,176,002,
123,254,255,032,248,122,254,255,
032,243,205,176,002,123,254,255,
040,248,017,000,111,237,083,178
4980 DATA
092,205,029,013,022,000,000,066,
065,083,073,067,032,104,097,115,
032,098,101,101,110,032,109,111,
118,101,100,046,032,022,002,000,
080,082,069,083,083,032,065,078,
089,032,075,069,089,032,084,079,
032,067,076,069,065,082,032,077,
069,077,079,082,089,046,042,178,
092,034,139,253,033,132,253,054,
000,042,133,253,086,035,094,035
5060 DATA
035,035,229,229,193,042,135,253,
175,237,066,210,174,254,225,017,
118,254,001,055,000,205,219,033,
042,139,253,017,000,111,237,082,
043,017,016,039,205,105,254,017,
232,003,205,105,254,017,100,000,
205,105,254,017,010,000,205,105,
254,017,001,000,205,105,254,062,
253,205,048,018,201,175,060,237,
082,056,002,024,249,025,198,047
5140 DATA
215,201,022,000,000,084,111,032,
115,097,118,101,032,066,065,083,
073,067,032,097,115,032,116,101,
120,116,032,102,105,108,101,058,
013,013,083,065,086,069,032,034,
110,097,109,101,034,032,067,079,
068,069,032,050,056,052,049,054,
044,000,235,030,032,001,232,003,
205,182,255,001,100,000,205,182,
255,001,010,000,205,182,255,125
5220 DATA
254,032,040,002,198,048,205,201,
255,225,126,035,229,254,034,032,
010,245,058,132,253,238,001,050,
132,253,241,254,013,040,023,254,
014,032,009,225,001,005,000,237,
074,229,024,221,254,032,048,002,
024,215,254,123,048,042,245,058,
132,253,203,143,050,132,253,241,
254,013,204,025,255,254,058,204,
025,255,205,201,255,254,013,032
5300 DATA
184,225,195,032,254,245,058,132,
253,203,151,050,132,253,241,201,
254,128,048,029,254,124,040,015,
254,126,040,011,033,132,253,203,
070,032,195,203,086,032,191,214,
031,205,119,255,205,110,255,024,
136,254,144,048,004,062,032,024,
173,254,165,048,004,214,079,024,
165,254,234,032,010,245,058,132,
253,203,215,050,132,253,241,214
5380 DATA
165,205,119,255,205,110,255,195,
205,254,058,132,253,203,207,050,
132,253,201,017,152,000,245,205,
124,007,056,012,058,132,253,203,
079,032,005,062,032,205,165,255,
026,230,127,205,165,255,026,019,
135,048,245,209,254,072,040,003,
254,130,216,122,254,003,216,062,
032,213,217,205,201,255,217,209,
201,123,254,255,032,014,062,000
5460 DATA
024,010,175,237,066,060,048,251,
009,061,040,237,254,032,040,005,
198,048,017,255,000,229,042,139,
253,119,035,034,139,253,225,201
9992 RANDOMIZE USR VAL "100": S
AVE "BS2TXT.B2" LINE 1
9993 RANDOMIZE USR VAL "100": S
AVE "bs2txt.C1"CODE 64900,592
9998 RANDOMIZE USR VAL "100": L
OAD "L.B1"
```

747 FLIGHT SIMULATOR MANUAL

by
Derik Ashton

At the Milwaukee Fest during the SNUG meeting Saturday evening, it was suggested that we all get to work and get out documentation for all the software that was available for the Sinclair family of computers. If every person would submit just one document that was never available before, a lot of work could get done.

Our group offers one piece of software that no one else in this community has, and we sell it on behalf of the author. [See ad elsewhere in this newsletter.] GATOR has worked with Derik Ashton for two years since Derik's move here from the U.K. We present the manual here for your inspection to give you an idea of the softwares capability.

We can supply this software on LarKen 5 1/4" SSDD, DSDD, DSQD or 3 1/2" DSQD, please call.

CLASSIFIED ADS

To put an AD in the Computer related section of the BBS, put a file in your account with the filename.filetype: COMPUTER.ADS
! ! ! Our ADS are free ! ! ! !

AD BY: AL MAHANNA ON 900222
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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H708/392-2982 or W708/576-4515

AD BY: Terry Starai ON 900320
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TDP System 100 Mini Disk Drive
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Miscellaneous
cables and Manuals
All the above items work fine and are in good shape.
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AD BY:MIKE CARRINGTON ON 900810
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AD BY: JIM PEULECKE ON 880205
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COMES WITH BASIC AND THREE APPLICATION PROGRAMS BUILT IN.
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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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C L E A N ! $40

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Model CD 1464W $239
Diagonal 13 inches
RGB Color Graphics card $39
John Champlin 480-5225 w
520-1534 h

AD BY: Keven Kohnen ON 900925
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
Radio Shack TRS-80 (CC1)
IBM style keyboard
Radio Shack Cassette Recorder
Tandy DCM-3 Modem
Set standard Joysticks
Digital/TEAC Dual Disk Drives
J&M DOS controller.
Game software
Cables and Manuals
Keven Kohnen W708/632-6928

ADD BY: Paul Carlson ON 900925
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
Boonton RF Signal Generator
Model 78B
15-25 MHz 190-230 MHz $10
Homemade RF Power 'Sniffer'
With Manual $7
HeathKIt #S-1 Electronic Switch
With Manual $5
HeathKit Audio Freq Meter ...$5
Zenith U.S. Army Signal Corps Frequency Meter
125KHz - 20 MHz $10
Paul Carlson H708/790-2993

dacc
•LIMITED•

747 FLIGHT SIMULATOR

for

ZX Spectrum (48K)

OPERATING INSTRUCTIONS

This program produces a true simulation of the flight characteristics of a Jumbo-jet, giving both an accurate "pilot's view" of the runway and a realistic portrayal of the flight deck instrument panels. The keyboard (and optionally, one joystick) is used to control the simulator. All the essential flight instruments are represented on the screen and these, together with a host of other indicators will keep you informed of the aircraft's situation, condition and performance.

The DACC 747 Flight Simulator allows you to perform the following:-

- Take-off.
- En-route flight between airports.
- Land at any one of seven airports (London-Heathrow, London-Gatwick, Manchester, Birmingham, Newcastle, Edinburgh and Prestwick).
- Taxi in vicinity of runways (not to exceed 40 knotts).
- Select a straight-in approach landing to Heathrow(aligned with runway).

To achieve these things you have control over a number of aircraft features and systems. These are:-

- Engines on/off.
- Engine power (throttle setting).
- Engine forward/reverse thrust.
- Fuel (take-on/jetison).
- Elevators (keyboard or joystick).
- Ailerons (keyboard or joystick).
- Flaps.
- Spoilers (or speed-brakes).
- Landing Gear (raise/lower).
- Landing Gear steering.
- Wheel Brakes.
- Instrument Landing System.
- Warning Acknowledge.
- Destination Airport Selection.
- Pause/Restart Simulation.

c) **Compass.**

The Compass, identified by the symbol of an aircraft at its centre, gives a digital reading of the "heading" or direction of travel of the aircraft. The reading is in degrees ranging from 0 (zero) through 360. These readings represent a full circle and 0 and 360 are exactly equal, both representing north. If you start off on a heading of 0 degrees and then start to turn right, the reading will show 1, 2, 3 etc., when it has passed through 90 degrees you heading will be due east. If you start at 0 and turn left, the reading will first change to 360 and then decrease, 359, 358, 357 etc., until it reaches 270 which is due west. Further turning will point the aircraft to the south, eventually reaching 180 degrees which is due south.

Also shown on the compass are four indicator lights, placed symetrically around the aircraft symbol. These are "non-standard" and have been added to help you with navigation. One of the four indicators will always be illuminated and shows your aircraft's position relative to the airport selected as your destination (or the one you just left if no destination has been selected). Read these indicators by imagining the aircraft symbol to represent the airport on a map which is placed with north at the top. The indicator which is on then shows the quadrant of the map you are in, relative to that airport.

d) **Altimeter.**

Like the airspeed indicator, this instrument gives both analogue and digital readings. The analogue dial has two needles, the longer needle performs one revolution per thousand feet of altitude, the shorter, one revolution per ten thousand feet. The "rolling barrel" digital display has three digits representing the number of "hundreds" of feet of altitude. A reading of "123" would therefore represent an altitude of 12,300 feet.

e) **Vertical Speed Indicator.**

Vertical Speed is also known as "rate of climb and descent" and reports this as the number of feet per minute that your aircraft is gaining or losing altitude. It has no relationship with forward speed which is given separately by the airspeed indicator (a). The indicator is calibrated with the digits 0, 2, 4, and 6, which represent "thousands of feet per minute". The upper half of the instrument represents a climb at the given rate, and the lower half represents a descent. It is possible to exceed the limits of this instrument (even on the prototype) in which case an unreliable reading is given. Correct flying procedure, if followed, would keep your vertical speed with the 6,000 ft. per minute capacity of the indicator.

f) **Annunciator Panel.**

This is a set of illuminating warning or alarm indicators relating to various aircraft systems or flight situations. Some of the alarms are accompanied by an audible buzzer. Each indicator is identified by a two letter code. This becomes much more readable when the indicator illuminates, as in the prototype. The codes and their meanings are:-

BR Brakes Applied.
OH Brakes Overheating.
LS Left Wing Stalled.
RS Right Wing Stalled.
FR Flap Load Relief System Operating.
XS Excess Speed.
AL Altitude Warning.
ST Stall Warning.

Flaps may be extended through six positions from 1 degree to 30 degrees. The calculations to dictate which Flap setting to use at which speed must take into account several factors but weight is the main one. For simplicity the following guidelines may be used -

1	degree	flap	- 270	knotts	and below
5	"	"	- 250	"	"
10	"	"	- 230	"	"
20	"	"	- 210	"	"
25	"	"	- 190	"	"
30	"	"	- 170	"	"

These setting are reduced for take-off or for light loads.

j) Fuel-flow Gauges.

These gauges, together with those described in (k), (l) and (m) below, are in sets of four, one for each of the 747's four turbo-fan engines. For each engine that is running the Fuel-flow guage will show a reading relative to the volume of fuel being consumed.

k) Exhaust Gas Temperature Gauges.

One for each engine. Engines should not be run at high temperature for long periods.

l) Engine Spool Speed.

Jet engines fitted to 747s, such as the JT9D, have three separate rotating blade assemblies (or spools). The reading given by these gauges can be taken as equivalent to engine revs. for the purpose of monitoring engine performance.

m) Engine Pressure Ratios.

The readings given here are the main indications of the output performance of each engine. Produced by monitoring and comparing the gas pressures at each end (intake and exhaust) of the engine, the EPRs will vary with both engine speed and airspeed. The latter is because of the "ram" effect of the front of the engine being forced through the air when at higher airspeeds. This reduces the differential between the two measured pressures therefore showing a drop in engine performance at high speeds. This can be seen when an engine is shut-down or at low revs., when a high airspeed is achieved, the EPR will actually read negative. This is because the engine is presenting more resistance to forward motion than thrust.

n) Reverse Thrust Indicators.

When the thrust reverser mechanisms on the engine nacelles are moved into "reverse thrust" position, these indicators are illuminated. Reversal of engine thrust is not achieved by changing the direction of rotation of the blade assemblies, that would not be possible. It is done by some mechanism which intercepts the high-speed gas and/or air flows produced by the engine and deflecting them forwards. Only about 50% of the thrust can be effectively used this way, but that is still a very significant contribution to the deceleration required to bring a heavy airliner to a slow pace.

o) Landing Gear Status Indicators.

When illuminated, these indicators show that the five landing gears are down and locked in position for landing. During the time that the gears are in motion up or down, the indicators will flash. When off, the gears are up and stored away with bay doors closed.

THE CONTROLS

The 747 Flight Simulator can be controlled entirely from the keyboard if desired. Optionally, a joystick which emulates the cursor keys may be used to represent the control column of the aircraft.

Moving the joystick to left or right when the aircraft is travelling faster than stall speed (airborne or not), will cause the aircraft to bank in the respective direction. When airborne, this results in a turn in the direction of bank. This happens because the left/right movement of the joystick controls the ailerons. Once the ailerons have been deflected from level they remain so until either the joystick is moved in the opposite direction or the fire button is pressed. In the latter case the ailerons return to the level position, but this does not produce straight and level flight as might seem likely. Once banked, an aircraft will stay such until opposite aileron is applied, so levelling the ailerons simply freezes the rate of turn, and does not canel it. During the time the ailerons are deflected the bank and the rate of turn are gradually increasing. It follows then that to achieve gentle, controlled turns of small amounts, as required when lining up with the runway, it is sufficient to quickly tip the joystick to one side, then shortly afterwards press the fire button. The aircraft will now be turning very slowly. Then at the desired heading, repeat the process with opposite movement and the aircraft will resume straight flight.

Pushing the joystick forward or pulling it back operates the elevators, situated at the trailing edge of the horizontal stabaliser. A pull on the joystick raises the elevators which causes the nose of the aircraft to rise. The angle of attack of the main wings increases and so does the lift produced, causing the aircraft to climb (or reduce its rate of descent). This will increase the drag and slow down the aircraft unless power is increased to compensate the extra drag. If airspeed is lost then the climb will also quickly disappear. Control of the aircraft's vertical speed (climb and descent) is almost always achieved by the combined use of elevators and engine power. In fact gentle changes in your descent rate on approach to landing are best made by adjusting throttle level alone.

KEYBOARD CONTROLS.

All of the keyboard keys are used to control various parts of the aircraft or the simulator. Keys may be pressed singly, for a short duration or held down, in which case they will "repeat" at varying speeds depending on their function.

Control Column.

The keys which may be used in place of (or alongside) a joystick, and which have the same effects as described above, are 5 and 8 for left and right (these are better viewed as the left and right arrows) and (up arrow) and (down arrow) for up and down. The 9 key has the same effect as the fire button (level ailerons or straight ahead tiller).

Engine Start-up and Shut-down.

The four engines are stopped and started by the keys 1-4 respectively. When and engine's key is pressed, it will stop if it was previously running, or start if it was previously stopped. Each engine contributes separately to the total thrust produced by the aircraft. You can tell which engines are running by reference to the fuel flow guages, which only read minimum when an engine is completely stopped, and the small green light which is only illuminated for each engine when it is running.

FLIGHT PROCEDURES

Take-off.

This is much easier than landing but there is still a correct procedure to follow. Assuming that all such things as instrument and system checks have been carried out successfully, prepare to take-off by:-

1) Switch on all engines (keys 1-4).
2) Set Flaps to 10 degrees (if light), or 20 degrees (if heavy) (Third and forth notch down the scale respectively).
3) Apply brakes. Optional but prevents aircraft rolling out before engines reach very effective power output.
4) Increase throttle until aircraft starts to move.
5) Release brakes (if applied). Note that full brakes will just hold the aircraft at full power.
6) Run throttle up to full power.
7) Watch Airspeed Indicator.
8) Keep aircraft straight along the centre of the runway using the tiller (see taxi keys). If starting from beginning of program this will be automatically corrected.
9) When airspeed reaches 170 knotts pull back joystick (or press curser down key) until Elevator indicators have moved up two notches. Observe rate of climb (vertical speed). If still zero apply more up elevator until take-off is achieved.
10) Once clear of runway, raise landing gears.
11) Watch that rate of climb does not exceed about 4000 feet per minute. If so apply down elevator until 2000 to 4000 is shown.
12) Watch airspeed increase. When at 230, Retract flaps two notches. When at 270, retract Flaps fully.
13) Reduce power to avoid engine overheat.
14) As airspeed increases apply down elevator to maintain steady rate of climb.
15) When at required altitude reduce power until rate of vertical speed settles at zero.

Course alteration or destination airport selection can take place during above procedure once aircraft is 500 feet clear of runway.

Landing.

This task is somewhat more demanding than the take-off but can be mastered by carefully following these recommendations. A lot of practice will be required with the emphasis on delicacy. The surest way to miss the runway is to bank heavily in trying to correct a small error in alignment with the runway. This is usually done because the results of a turn seem slow to come but recovery from a steep bank will take far longer. The best way to get in a lot of landing practice is to take off from Heathrow then take a wide turn right onto 180 degrees (heading south) straight into Gatwick. Don't climb to more than 3000 to 4000 feet or let airspeed exceed about 230 knotts. The runways at all the airports are aligned north/south (unlike the actual sites) and can be approached from either direction. This means they are numbered 18 (flying south - 180 degrees) and 36 (flying north - 360 or 0 degrees).

1) Align your flight-path with the runway from as far away as possible (20 miles would be reasonable). To aid in this task, the four indicators in the compass can be very helpful. They can tell you, even when you are too far away to see the runway in any detail, which side of the runway centreline you are and just when you cross it. Within a range of 50 miles activate the ILS for further guidance.

2) Reduce your approach speed in plenty of time. This gives you more time to think and react along the final approach. Reduce throttle in a series

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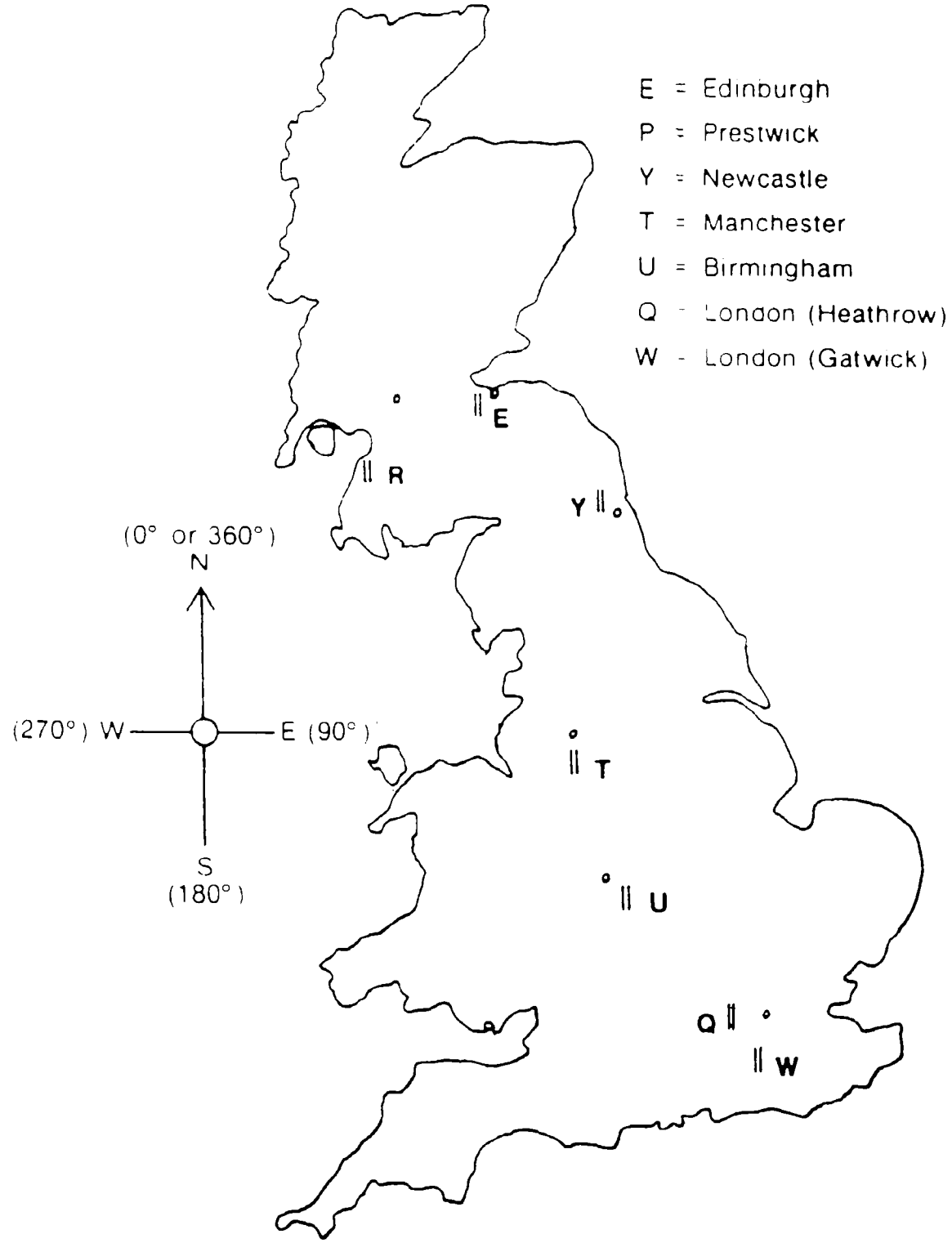

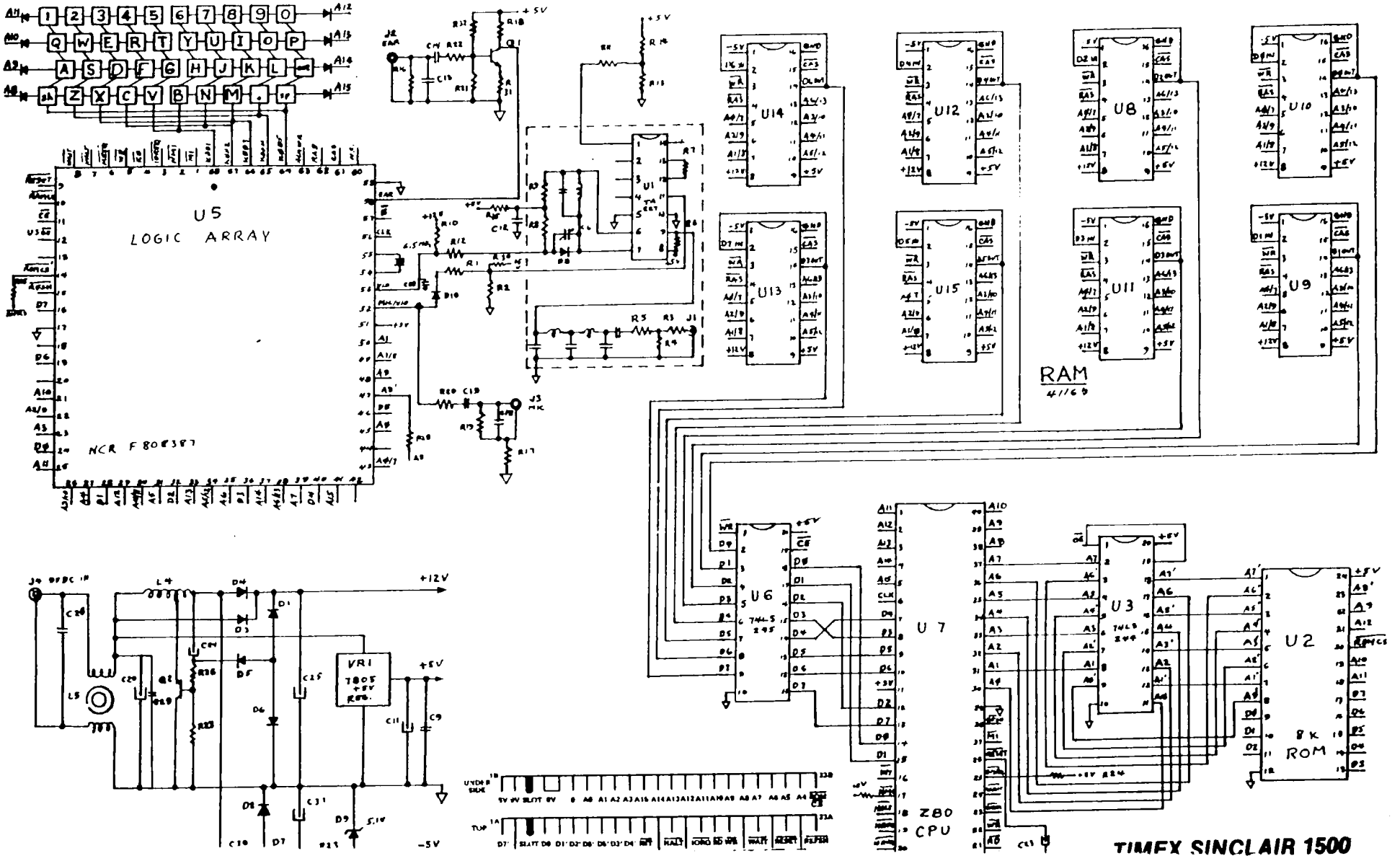
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